Matrix metalloproteinase 9 and its tissue inhibitor 1 in obesity

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Introduction:
Obesity can be defined as a multifactorial chronic disease, characterized by an excessive body fat accumulation, an energy homeostasis imbalance and by severe inflammation mechanisms. This systemic inflammation occurs due to the secretion of adipokines, translating into adipogenesis, angiogenesis and extracellular matrix (ECM) remodeling. The ECM remodeling is mediated by matrix metalloproteinases (MMPs) and regulated by their tissue inhibitors (TIMPs), among which worth mentioning the role of MMP-9 and its inhibitor TIMP-1, contributing to the pathophysiology of the disease and to the development of associated complications, such as cardiovascular diseases.
Objectives:
To determine the serum levels of MMP-9 and TIMP-1 and the MMP-9/TIMP-1 ratio and evaluate their correlation among the groups of the study population: normal weight individuals, overweight individuals and obese individuals.
Methods:
The 41 subjects of the study population were grouped in normal weight individuals, overweight individuals and obese individuals according to the total fat mass percentage determined by dual-energy x-ray absorptiometry (DXA). The semi-quantification of MMP-9 and TIMP-1 in the serum was performed through the slot-blot technique.
Results:
The MMP-9/TIMP-1 ratio were tendentially higher ($p > 0.05$) in obese individuals (1.08 ± 0.61) compared to overweight (0.91 ± 0.34) and obese groups (0.80 ± 0.36). In opposition, the levels of TIMP-1 were tendentially higher in the normal weight group in comparison with overweight and obese groups ($p > 0.05$). A moderate positive correlation between MMP-9 and TIMP-1 levels was observed ($r = 0.691$; $p \leq 0.001$).
Conclusions:
MMP-9 and TIMP-1 seem to be involved in the tissue remodeling in obese individuals, manifested by MMP-9 overexpression and an imbalance in MMP-9/TIMP-1 ratio.